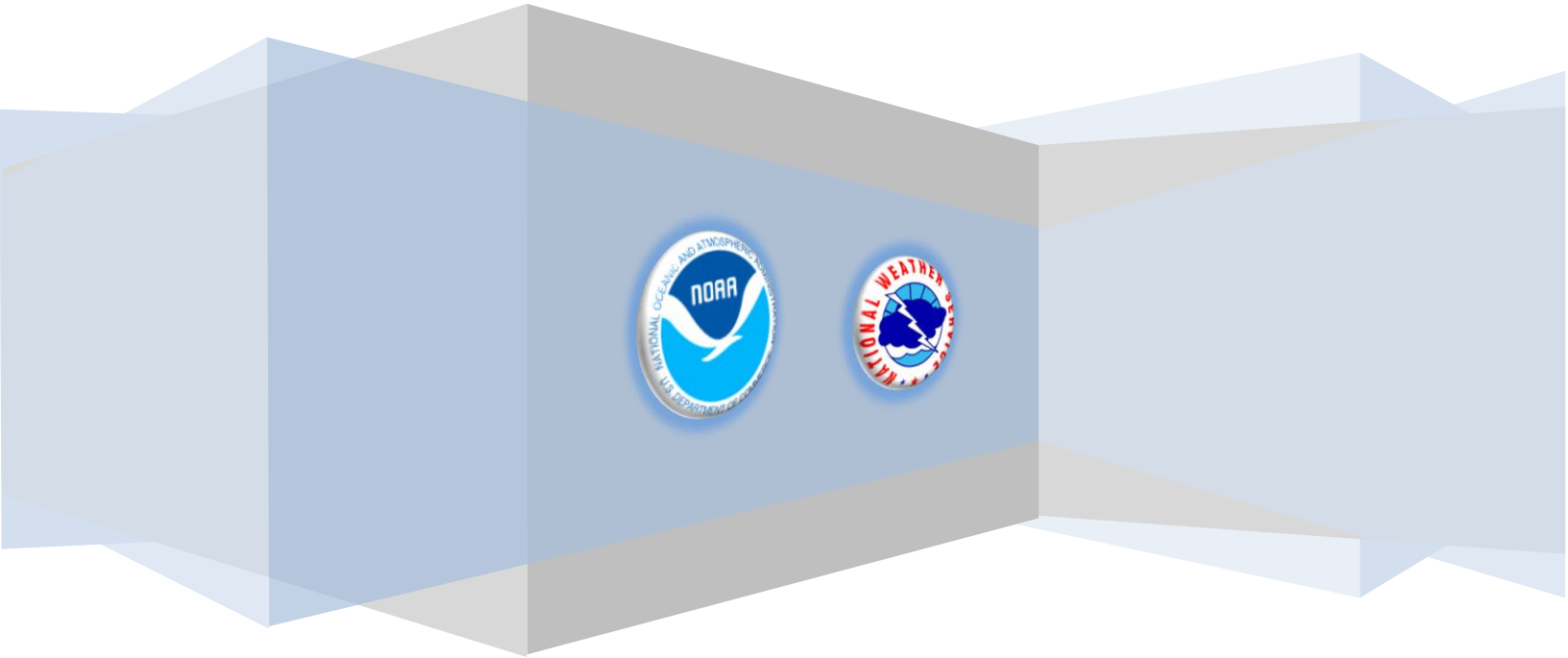
Natural Hazards Assessment

Taylor County, WI

Prepared by: NOAA / National Weather Service La Crosse, WI



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for
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Prepared by NOAA / National Weather Service – La Crosse
Last Update: June 2010

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Overview

Taylor County is a large county in the western Great Lakes section of the Midwest (north-central Wisconsin) with hilly to relatively flat terrain. Much of the county is heavily forested, including the Chequamegon National Forest.

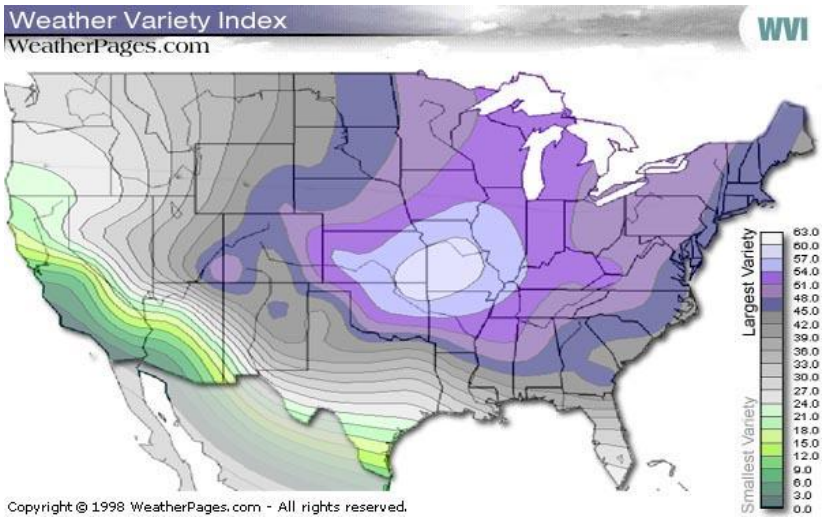
The area experiences a temperate climate with both warm and cold season extremes.

Winter months can bring occasional heavy snows, intermittent freezing precipitation or ice, and prolonged periods of cloudiness. While true blizzards are rare, winter storms impact the area on average about 4 times per season. Occasional arctic outbreaks bring extreme cold and dangerous wind chills.

Thunderstorms occur on average 30 to 50 times a year, mainly in the spring and summer months. The strongest storms can produce associated severe weather like tornadoes, large hail, or damaging wind. Both river flooding and flash flooding can occur. Heat and high humidity is occasionally observed in June, July, or August.

The autumn season usually has the quietest weather. High wind events can also occur occasionally, usually in the spring or fall.

The variability in weather can be seen in the following graphic, created by a private company (weatherpages.com) that rated each city on variations in temperature, precipitation, and other factors. Green Bay, WI ranked 80th and La Crosse, WI ranked 27th highest in variability out of 277 cities.

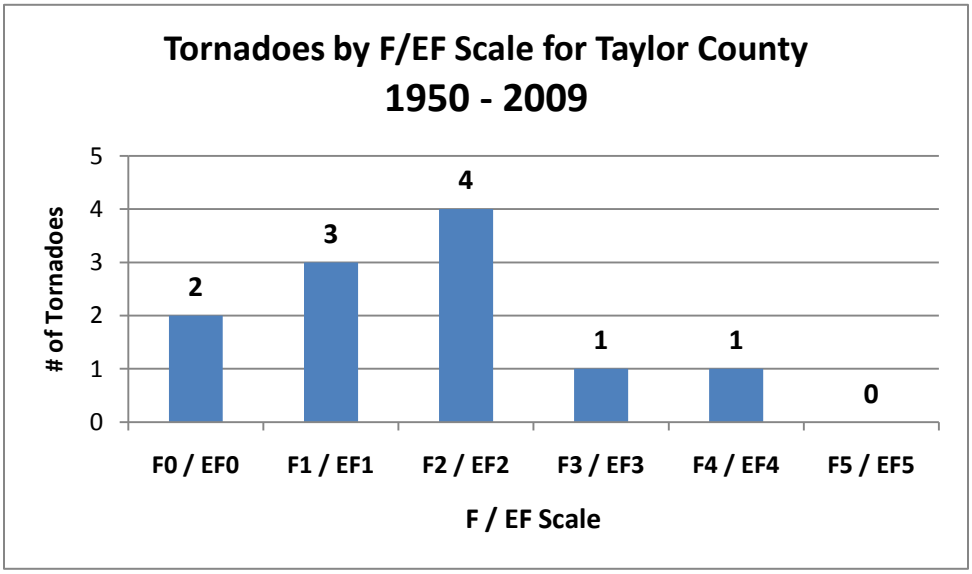


Since 1998, Taylor County has been included in a FEMA Federal Disaster Declaration 3 times:

2001 – Flooding
2002 – Severe storms / flooding
2004 – Severe storms / flooding

Tornadoes

Taylor County has had 11 documented tornadoes since 1950, averaging about one tornado every 5 years. Wisconsin averages 21 tornadoes per year. Most tornadoes are short-lived and small. May and June are the peak months and most occur between 3 and 9 p.m., but they can occur nearly any time of year and at all times of the day.



Most recent tornadoes:

- June 4, 2005 (F1)
- June 4, 2005 (F0)
- Sept.30, 2002(F0)
- Sept.2, 2002 (F2)
- July 30, 1977 (F3)
- June 26, 1969 (F1)
- July 3, 1966 (F2)
- June 29, 1966 (F2)
- July 6, 1964 (F2)
- Aug.27, 1960 (F1)
- May 10, 1953 (F4)

There certainly seems to be a history of September tornadoes in Taylor County. A significant tornado struck the county on Labor Day in 2002. It touched down just west of the village of Gilman and moved east-southeast through the county for 17 miles. Damage in Gilman was extensive, especially at the school where roofs were torn off. A large forested area in the middle of the county was mowed down and a few homes along the path lost entire 2nd floors. Luckily there were no reports of injuries or fatalities. A much larger tornado hit on September 21, 1924 killing a total of 18 people when it moved from neighboring northern Clark County to near the Rib Lake, WI area damaging numerous farms.

Strongest tornadoes: (1850-2008)

- Sept.21, 1924 (F4) – 50 inj, 18 dead
- May 10, 1953 (F4) – 2 inj, 0 dead
- July 30, 1977 (F3) – 8 inj, 1 dead
- Mar.27, 1945 (F3) – 1 inj, 0 dead
- July 6, 1964 (F2) – 2 inj, 0 dead

Taylor County Tornado Facts:

- No F5 or EF5* tornadoes
- Last violent tornado - 1977
- 19 deaths and 64 injuries since 1850
- Tornadoes have occurred March – September
- Most have occurred in June (4)

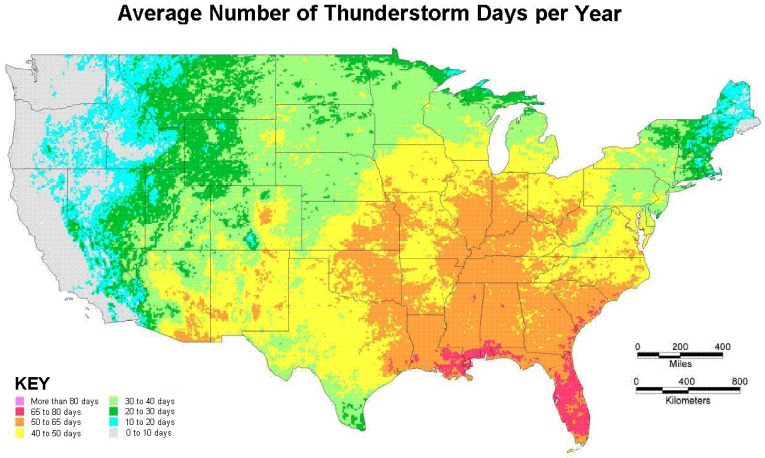
Tornado Watches		Tornado Warnings	
Year		Year	
2009	2	2009	0
2008	5	2008	0
2007	7	2007	0
2006	2	2006	0
2005	5	2005	4
2004	3	2004	0
2003	2	2003	0
2002	4	2002	5
2001	7	2001	0
2000	3	2000	0

Enhanced Fujita (EF*) Scale	
EF0	65-85 mph
EF1	86-110 mph
EF2	111-135 mph
EF3	136-165 mph
EF4	166-200 mph
EF5	>200 mph

* Began February 1, 2007

Severe Thunderstorms / Lightning

Taylor County averages 37 thunderstorm days per year. The National Weather Service (NWS) considers a thunderstorm severe when it produces wind gusts of 58 mph (50 knots) or higher, 3/4 inch diameter hail or larger, or a tornado.



Downdraft winds from a severe thunderstorm can produce local or widespread damage, even tornado-like damage if strong enough. Most severe thunderstorm winds occur in June or July and between the hours of 4 and 8 p.m., but can occur at other times. Most damage involves blown down trees, power lines, and damage to weaker structures (i.e. barns, outbuildings, garages) with occasional related injuries. In May 1996, a line of severe thunderstorms produced straight-line winds up to 90 mph. Several barns and homes were damaged or destroyed along Highway 73, Highway 64 and County Road F. Wide swaths of trees were also knocked down and a barn was damaged in the Rib Lake area. In June 2005, a wind gust of 82 mph was recorded at the Taylor County Airport, near Medford, damaging several nearby hangars. There have been 79 reports of damaging wind since 1982.

Large hail can also occur in a severe thunderstorm. June is the peak month with the most common time between 1 and 9 p.m., but it can occur in other warm season months and at any time of day. Hail is typically a crop damaging hazard but can damage roofs, windows, and vehicles if large enough (> 1”). Expenses can be high. Injuries or fatalities are rare for hail. In June 2007 there were 6 reports of large hail hitting the county but in July 1995 hail larger than baseballs (3”) fell just west of Medford, WI causing major damage. There have been 53 large hail (≥ 3/4”) reports in the county since 1982.

Non-severe thunderstorms still pose a lightning risk. According to the Vaisala Group, an average of nearly 300,000 cloud-to-ground strikes hit Wisconsin each year based on data from 1996 to 2005. There was a lightning fatality in Wisconsin both in 2007 and 2008. In July 1999, a 24-year old Amish man was killed by lightning in Taylor County while riding on a buggy.

Severe Thunderstorm Watches		Severe Thunderstorm Warnings	
Year		Year	
2009	3	2009	4
2008	7	2008	6
2007	17	2007	11
2006	20	2006	5
2005	17	2005	5
2004	9	2004	1
2003	4	2003	0
2002	22	2002	11
2001	9	2001	4
2000	12	2000	8

Flooding and Hydrologic Concerns

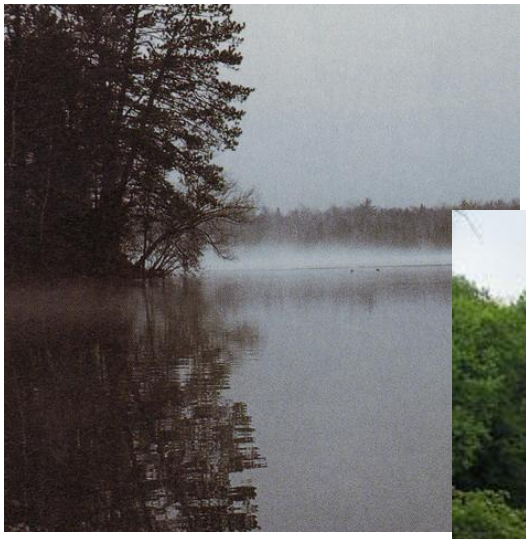
On occasion intense, heavy rain producing thunderstorms or consecutive thunderstorms ("training") can bring excessive rainfall leading to flash flooding in Taylor County. Given the relatively flat terrain, "ponding" or collecting of water is more likely, but true flash flooding and erosion problems can develop if rainfall is excessive enough.

June is the most common month for flash floods, but they can occur from May through September. They are most common in the evening hours, between 8-10 p.m., but can occur at other times and typically last from 3-6 hours. Between 1982-1997, there were 8 deaths from flooding in Wisconsin.

Flash Flood Warnings	
Year	
2009	1
2008	0
2007	0
2006	0
2005	0
2004	0
2003	0
2002	1
2001	0
2000	1

On June 21-22, 2002, rounds of thunderstorms with heavy rain led to extensive flash flooding over central Wisconsin. Parts of Taylor County were hit with over 4 inches of rain which led to the flooding of numerous county roads and highways. Road erosion also occurred.

River flooding in Taylor County is rare with the headwaters of several rivers originating in the area. Notably the Black River begins in the area and then flows south into neighboring Clark County. The Jump, Yellow, and Big Rib Rivers, in addition to other creeks and flowage areas, also flow through the county. There are also several sizeable lakes, especially in the Chequamegon-Nicolet National Forest. The National Weather Service does not maintain any river gauges in Taylor County so river levels are monitored manually and locally if needed.



Winter Storms and Extreme Cold

Hazardous winter weather can bring a variety of conditions to Taylor County. Since 1982, there have been 75 winter storms to hit the county with an average of 3 each season. Heavy snow, blowing snow, ice, and sleet all occur, although blizzards are more rare (only 3 since 1982). There have been a total of 4 documented deaths and 49 injuries as a direct result from winter storms in Wisconsin since 1982.

The 30-year average seasonal snowfall at Medford, WI is 36.9 inches. The all-time record one-day snowfall is 24.0 inches that occurred at Medford on December 28, 1904. The bulk of snow falls between December and March. The largest winter storms tend to form over the central or southern Plains, then move northeast towards the western Great Lakes.

There have been numerous notable winter storms and heavy snows in the record books. In November 2006 over 13" of snow fell across the southern parts of the county from a passing storm. In early January 1929, over 20" of snow was reported over a three day period. Most recently, December 2008 went into the record books as the snowiest December ever with 34.5", nearly equaling the normal seasonal total.

Top 5 Seasonal Snowfalls at the Medford, WI

Years	Snowfall
1928-29	96.0"
1950-51	91.0"
1949-50	84.5"
1942-43	81.0"
1951-52	80.0"

March can often be a snowy month. Even though snowfall may be less frequent, heavy wet snow can form from large spring storms. On March 9, 1918, 18" of snow fell at Medford, and over 30" of snow was recorded in March 1956.

Ice storms (1/4" of ice or more) can occur but are relatively rare with only 8 occurrences since 1982. In January 2005, freezing rain led to ice accumulation up to a ½ inch thick in spots. Ice an 1/8 – ¼ inch thick fell as recently as January 3, 2009.

Arctic cold outbreaks can occur in the upper Midwest as well. Snow depth can modify these cold temperatures leading to sub-zero readings on average 39 times a winter. Occasionally strong northwest winds will combine with arctic outbreaks to create dangerous wind chill conditions as well. The coldest temperatures are usually in January and February with average lows in the single digits and record lows colder than -30°F most days. The all-time record low is -45°F set back in February 1899.

Coldest Lows at Medford, WI

Low	Date
-45°F	2/10/1899
-42°F	2/11/1899
-40°F	3/1/1962
-40°F	1/6/1912
-39°F	2/5/1895

In late January and early February 1996, Medford, WI went 7 consecutive days with temperatures below zero degrees (F) following a blizzard about a week earlier. Low temperatures during this stretch were -22°F, -36°F, -35°F, -37°F, -37°F, -37°F, and -35°F over seven straight mornings. In late January and early February 1899, there were 18 straight days with lows at -15°F or colder – the longest such streak.

Since 1982 there have been 27 fatalities in Wisconsin from cold weather and 42 direct injuries.

The La Crosse National Weather Service issues Wind Chill Advisories when wind chill readings of -20°F to -34°F are expected. Wind Chill Warnings are issued when wind chill values at or below -35°F are expected or occurring. The wind chill hit -44°F on January 30, 2008 at Medford, WI.

Heat, Drought, and Wildfires

On occasion the weather pattern across the upper Midwest favors prolonged heat and humidity, leading to heat waves. June through August are the warmest months with average high temperatures in the 80s and record highs above 95°F most days. The warmest temperature on record at Medford, WI is 104°F set on July 13 and July 14, 1936.

Warmest Highs at Medford, WI	
High	Date
104°F	7/14/1936
104°F	7/13/1936
103°F	7/12/1936
103°F	6/19/1900
102°F	7/17/1901

Since 1982, there have been 115 fatalities directly related to heat waves and another 95 indirectly, in Wisconsin. In Taylor County, there have been 11 heat waves since 1982 but no heat related fatalities documented.

One of the longest heat waves on record occurred in July 1936 when the Taylor County area hit 90°F or higher for 12 consecutive days, including 5 days at or above 100°F and all-time record highs of 104°F as noted above. Back in July 1901, high temperatures hit 90°F or warmer on 14 of 16 days. More recently, heat waves have occurred in 1995, 1999, and 2001.

Prolonged dry spells can also lead to drought causing extreme damage to crops. Droughts vary in length and intensity but abnormally dry to moderate drought conditions can occur quite frequently. Severe to extreme droughts occur far less frequently.

Droughts have occurred in Wisconsin as recently as 2005 to 2009 with low water levels and limited lake use by many groups.

Dry weather can also lead to a wildfire threat, especially in the spring before foliage has emerged (i.e. before green up) or in the fall after vegetation has started to die off. Warm, dry (i.e. lower relative humidities), and windy conditions all favor higher fire danger and can lead to sporadic grass fires in Taylor County. Thick, wooded areas, especially in areas thick with Jack Pines or pine plantations, also pose a threat for wildfires under extremely dry conditions but occur far less frequently.

Local Climatology

Here are some basic climatology figures for the Taylor County area. Data is valid for Medford, WI based on normals from a 30-year period (1971-2000).

Month	Normal Maximum Temperature	Normal Minimum Temperature	Average Temperature	Precipitation	Snowfall
JAN	19.8	-0.2	9.8	1.18"	9.1"
FEB	26.2	5.4	15.8	0.91"	5.9"
MAR	36.9	17.7	27.3	1.87"	7.1"
APR	52.4	31.2	41.8	2.51"	1.6"
MAY	66.5	43.1	54.8	3.16"	0.0"
JUN	74.4	52.1	63.2	4.44"	0.0"
JUL	78.7	56.9	67.8	3.97"	0.0"
AUG	76.6	55.0	65.8	4.68"	0.0"
SEP	67.3	45.7	56.5	4.55"	0.0"
OCT	55.0	34.4	44.7	2.58"	0.4"
NOV	37.9	22.2	30.0	2.13"	4.0"
DEC	24.4	7.1	15.8	1.28"	8.8"
Year	**51.3**	**30.9**	**41.1**	**33.24"**	**36.9"**

Note: Cooperative weather data for Medford, WI begins in 1889.

Miscellaneous facts:

- Warmest year on record – 1998 (45.9°F)
- Warmest month on record – August 1900 (74.9°F)
- Warmest day on record – July 13/14, 1936 (104°F)
- Greatest number of days with 90°F or warmer – 1900 (40 times)

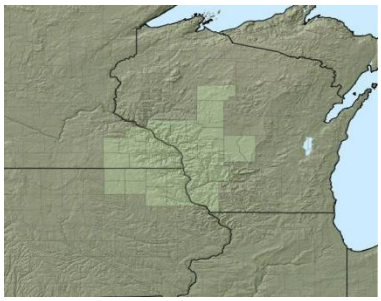
- Coldest year on record – 1917 (37.5°F)
- Coldest month on record – January 1912 (-4.0°F)
- Coldest day on record – February 10, 1899 (-45°F)
- Greatest number of days at 0°F or colder – 1978 (69 times)

- Wettest year on record – 1903 (47.15")
- Wettest month on record – June 1905 (16.20")
- Wettest day on record – June 5, 1905 (8.00")
- Driest year on record – 1976 (19.27")
- Driest month(s) on record – December 1943 and 1898

- Highest seasonal snowfall on record – 1928/29 (96.0")
- Highest monthly snowfall on record – January 1929 (37.5")
- Highest one-day snowfall on record – December 28, 1904 (24.0")
- Least seasonal snowfall on record – 1989/90 (10.6")

NOAA/National Weather Service Support and Weather Monitoring

NOAA's National Weather Service (NWS) forecast office at La Crosse, WI serves Taylor County with weather information and support on a continuous basis. Operating 24 hours a day, a staff of 23 issues routine and non-routine informational products for the area, including all watches, warnings, and advisories related to natural hazards. Doppler radar (WSR-88D) is co-located with the La Crosse NWS office and covers the region.



NWS La Crosse has a web site at: www.weather.gov/lacrosse

Normal communication during hazardous weather scenarios is via telephone.

NOAA Weather Radio coverage in Taylor County includes three (3) transmitters:

- KZZ77 (Withee) – 162.425 MHz
- WXJ89 (Wausau) – 162.475 MHz
- WNG577 (Ladysmith) – 162.550 MHz

Storm spotter groups consist of volunteer fire department personnel, law enforcement, amateur radio operators, and the general public. Spotter training is held almost every year with an average attendance in the past 5 years of 62.

There are a variety of weather monitoring sources in Taylor County, including:

Automated weather station(s):

- Medford (MDZ)
- Other nearby stations are located at Eau Claire (EAU), Rice Lake (RCX), Phillips (PBH), Tomahawk (TKV), Wausau (AUW), Mosinee (CWA), and Marshfield (MFI)

River Gauge(s):

- None

Cooperative Observer Locations:

- Goodrich 1E
- Jump River 3E
- Medford

In addition, numerous volunteer reports from around the county are received at the La Crosse NWS office including rainfall, snowfall, and temperatures, on a routine basis.

Resources

National Weather Service – La Crosse	www.weather.gov/lacrosse
NWS La Crosse Tornado Database	www.weather.gov/lacrosse/?n=tornadomain
NWS La Crosse River Monitoring	http://www.crh.noaa.gov/ahps2/index.php?wfo=arx
NWS La Crosse Climate	www.weather.gov/climate/index.php?wfo=arx
NWS La Crosse Drought information	www.weather.gov/lacrosse/?n=drought
NWS La Crosse Storm Summaries	www.weather.gov/lacrosse/?n=events
NWS La Crosse NOAA Weather Radio page	www.weather.gov/lacrosse/?n=nwr
NWS Storm Prediction Center	http://www.spc.noaa.gov/
SPC Online Severe Weather Climatology	http://www.spc.nssl.noaa.gov/climo/online/grids/ http://www.spc.noaa.gov/climo/online/rda/ARX.html

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